

REQUEST FOR RECONSIDERATION

Applicants wish to thank Examiner Kruer for withdrawing all previous grounds of rejection.

The claimed invention relates to a resin-coated hot dip galvanized steel sheet that includes the following:

a hot dip galvanized steel sheet; and

a resin film formed *directly* on a surface of said hot dip galvanized steel sheet,

said resin film comprising:

a polyolefin copolymer resin molecular-associated by ion cluster;

10 to less than 55 mass % of silica particles in terms of solids content;

1 to 8 mass % of a first crosslinking agent in terms of solids content; and

1 to 8 mass % of at least one of tannic acid and ammonium vanadate in terms of solids content.

(Present claim 1) (Emphasis added). The claimed hot dip galvanized steel sheet, having the specifically claimed resin film formed *directly* thereon, is excellent in corrosion resistance and exhibits excellent weldability and machinability. As such a resin-coated hot dip galvanized steel sheet is nowhere described or suggested in the cited references of record, reconsideration of the claimed invention is respectfully requested.

Claims 1-6 and 9 are rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 6,040,054 to Odashima et al. in view of Applicant's admissions and JP 2003073856 to Morishita et al. Claim 7 is rejected further in view of U.S. Patent No. 5,950,468 to Shimizu et al., and claim 10 is rejected further in view of U.S. Patent No. 6,015,855 to Dalton.

The rejections are respectfully traversed, since the references, alone or in combination, do not describe or suggest a hot dip galvanized steel sheet having the specific

resin film of the claimed invention formed directly on a surface of a hot dip galvanized steel sheet. The references are discussed in turn below.

The Odashima et al. Reference

As acknowledged by the Examiner on page 3 of the Final Office Action, the primary reference, Odashima et al., does not describe *several* limitations in the claimed invention. For instance, the Examiner admits that the reference does not describe “that the hydroxyl group containing organic resin should comprise an ionomer”, “that the resinous coating should comprise ammonium vanadate”, or even “that the steel sheet should be galvanized.” (Final Office at page 3, lines 8-22).

The Examiner asserts that one would have been motivated to modify the reference with these claimed limitations to improve various properties, e.g., “corrosion resistance”. (Final Office at page 3, lines 13 and 20; page 4, line 3).

However, according to the reference, properties, such as corrosion resistance, are already improved by the chromium-free metal surface treating composition described therein. For instance, the treating composition “is free of the . . . prior art drawbacks and . . . exhibits excellent adhesion and assures extremely excellent corrosion resistance and overcoat adhesion.” (Column 1, lines 60-63). (Emphasis added).

Regarding the surface treating composition, the reference describes a composition that comprises: (a) a hydroxyl group-containing organic resin, (b) a phosphoric acid, and (c) at least one of ions and/or compounds of at least one metal selected from the group consisting of Cu, Co, Fe, Mn, Sn, V, Mg, Ba, Al, Ca, Sr, Nb, Y and Zn (referred to as the “first invention”, and *may* include at least one of colloids or powders of SiO₂, Fe₂O₃, Fe₃ O₄, MgO, ZrO₂, SnO₂, Al₂ O₃ and Sb₂O₅ (referred to as the “second invention”).

However, there is no suggestion to use “powders of SiO₂” at the exclusion of any of the other several oxide materials disclosed, or that better properties would be achieved from by sole use of such an oxide material in the claimed range. Moreover, there is no indication whatsoever that adding ammonium vanadate in any amount would be effective, or would further improve the already improved corrosion resistance achieved by the composition.

Regarding the substrate used for the surface treatment, the reference also discloses that the composition may be generally applied to a surface of a metal. In particular, the reference lists several metal substrates that the composition would be effective for treating.

For instance, the metal substrates include:

cold-rolled steel sheets, plated steel sheets such as **Zn-electroplated steel sheets**[,] hot-dip Zn-coated steel sheets, **Zn--Ni**, **Zn--Ni--Co**, **Zn--Ni--Cr**, **Zn--Fe**, **Zn--Co**, **Zn--Cr**, **Zn--Mn**, **Zn--Al**, **Zn--Al** or **Zn--Mg alloy-electroplated** or hot-dip coated steel sheets, hot rolled skin steel sheets, hot rolled pickling steel sheets, stainless steel sheets, silicon steel sheets . . . [a]mong them, **Zn-plated** or Zn-containing metal sheets **are most effectively surface-treated**.

(Column 12, lines 1-20). (Emphasis added). However, none the above-mentioned metal substrates includes a *hot dip galvanized steel sheet* as required by the claimed invention. In fact, as shown above, the **Zn-electroplated steel sheets** are used and preferred, which are described throughout the several examples in the reference.

In the present invention, however, Zn-electroplated steel sheets are not used or even shown to be effective for the claimed invention. As recited discussed in the present specification,

[t]he present inventors have confirmed that in the case of a **Zn electroplated steel sheet**, even if the foregoing film is formed on the steel sheet surface, **desired characteristics (especially corrosion resistance) are not exhibited**.

(Present specification at page 17, lines 12-16) (Emphasis added).

Regarding the resin described for the composition, the reference discloses several organic resins, as well as methods for formulating the resins, throughout columns 5-8, that may be useful for the composition. However, there is no description whatsoever of a *polyolefin copolymer resin molecular-associated by ion cluster*. In particular, there is no specific description of emulsion-ionomerizing a polyolefin copolymer resin, under required specific temperature and pressure conditions with a suitable cation, to achieve a polyolefin copolymer resin molecular-associated by ion cluster for use in the composition.

Therefore, the Odashima et al. reference clearly does not describe or suggest the claimed invention.

The Morishita et al. Reference

The Morishita et al. reference generally describes a water-dispersible metal surface treatment agent, which includes an ionomer resin, silica, and a rust inhibitor selected from thiocarbonyl compounds or ammonium vanadates. (See Abstract and paragraph [0010] of the Detailed Description of the electronic-generated translation of the reference).

However, the reference clearly does not cure the deficiencies of the the Odashima et al. reference, since there is no evidence that modifying the composition with the ionomer resin would be effective. Moreover, there is no motivation to selectively choose ammonium vanadate and add it to the composition as a rust inhibitor, since Odashima et al. disclose that “extremely excellent corrosion resistance” is achieved without the use of such a compound. Further, there is no motivation to selectively choose a hot dip galvanized steel sheet from the reference, since the reference merely discloses that metallic materials, such as “electrogalvanizing steel materials, hot-dip zinc steel materials”, etc. may be used. (See paragraph [0049] of the reference).

Therefore, the claimed invention clearly would not be obvious in view of combination of the Odashima et al. and Morishita et al. references.

The Shimizu et al. Reference

Shimizu et al. generally disclose a metal sheet that includes a thermoplastic resin film thereon (column 1, lines 8-14; column 7, lines 7-16).). However, the steel sheet is preferably treated with a chromate treatment as discussed throughout the reference (*See* Examples 1-4 of the reference, which explicitly recite that the metal sheets are treated with a “chromate solution”).

Moreover, both of the Odashima et al. and Morishita et al. references, as well as the claimed invention, teach away from the use of any chromate treatment. In fact, both references explicitly recite that the inventions exclude performing any chromate treatment. As such, one would clearly not look to the Shimizu et al. reference for guidance for formulating a composition of the claimed invention.

Therefore, the claimed invention would not be obvious in view of the combination of the Odashima et al. and Morishita et al. references, and further in view of the Shimizu et al. reference.

The Dalton Reference

The Dalton reference generally describes paint formulations and uses thereof for improved properties, such as corrosion resistance, on a metal surface. However, the function of the paint formulation is to form a “mineralized layer” on a metal surface. (Column 2, lines 22-41). Moreover, the references discloses that a “wide variety of substances can be employed as precursors in the mineralized layer . . . [which include] one or more of the anions selected from the group consisting of **water soluble salts and/or oxides of . . .**

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chromium." (Column 2, lines 55-61). As such, the reference clearly would not cure the deficiencies of Odashima et al. and Morishita et al. references, since these references teach away from the inclusion of such compounds in their metal treating compositions.

Therefore, the claimed invention would not be obvious in view of the combination of these references.

In view of the foregoing reasons, Applicants respectfully request the withdrawal of the rejections under 35 U.S.C. § 103(a).

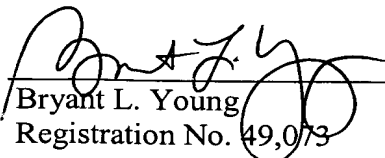
Applicants submit that the application is now in condition for allowance. Early notification of such allowance is earnestly solicited.

Applicants kindly request that the Examiner **acknowledge** the two Information Disclosure Statements filed May 3, 2004 and November 11, 2003 in the next Office Communication. To date, Applicants have not received copies of the PTO-1449 forms filed with these Information Disclosure Statements, which should contain the Examiner's initials and signature.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, he is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

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